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TAGS: TRGY ENRG KNNP IAEA FR
SUBJECT: GNEP - France Hosts Successful Third Reliable
Nuclear Fuel Services Working Group Meeting In Cherbourg

REF: A) 08 STATE 037716 B) 08 STATE 109919

SUMMARY AND COMMENT

¶1. (U) The third meeting of the Reliable Nuclear Fuel Services Working Group (RNFSWG) of the Global Nuclear Energy Partnership (GNEP) was held in Cherbourg, France on March 20. Twenty participants from ten countries and two international organizations attended this meeting, which was dedicated to discussion of sub-Working Groups identified at the September 2008 RNFSWG meeting (ref B).

¶2. (SBU) French representatives heavily promoted the use of existing spent fuel reprocessing techniques based on Plutonium - Uranium Extraction (PUREX) technology through a tour of the La Hague reprocessing plant, a discussion about France's spent fuel management policy, and tabling of a work plan for a sub-Working Group on "elements and criteria for closing the fuel cycle." The French encouraged Working Group endorsement for this Areva process. In response to concerns from the Republic of Korea, Jordan, and the United States, the Working Group agreed to add explicit language to the proposed work plan to clarify that it would address both near-term and long-term options (consistent with the last two elements of the GNEP Statement of Principles) as well as international aspects.

¶3. (SBU) In addition to discussions on the spent nuclear fuel back end of the fuel cycle, Poland presented a briefing on world uranium reserves and the IAEA presented conclusions on fuel fabrication

diversity and updates on recent proposals for nuclear fuel supply assurances. There was no interest registered in establishing a sub-Working Group on fuel assembly diversity, though it was agreed that the RNFSWG would pursue a workshop on industry views at its next meeting. There was more interest in a sub-Working Group on assurances of nuclear fuel supply, and Jordan agreed to chair a sub-group on this topic. It was agreed that the United States would retain the Working Group chair through the next RNFSWG meeting, which Poland offered to host in late September or the first week of October.

¶4. (SBU) COMMENT: Overall the meeting was a success, though the conversation was dominated by the United States, France, Jordan, Korea, and Poland. Very little was heard from Bulgaria, China, Japan, or Australia. Usual RNFSWG participants Canada, Russia, and the UK were absent from this meeting, as was Slovenia. END SUMMARY AND COMMENT

BACKGROUND

¶5. (U) On September 16, 2007, GNEP was formally established at a ministerial meeting in Vienna, during which two Working Groups on Infrastructure Development and Reliable Nuclear Fuel Services were established. The RNFSWG held its inaugural meeting in Wilmington, NC on March 31-April 1, 2008 (ref A) and its second meeting on September 3-4, 2008 in Vienna (ref B). GNEP presently consists of 25 Partners: Armenia, Australia, Bulgaria, Canada, China, Estonia, France, Ghana, Hungary, Italy, Japan, Jordan, Kazakhstan, the

Republic of Korea, Lithuania, Morocco, Oman, Poland, Romania, Russia, Senegal, Slovenia, Ukraine, the United Kingdom and the United States. There are three international organizations that participate as GNEP Observers: the IAEA, Euratom, and the Generation IV International Forum (GIF).

MEETING SUMMARY

¶6. (U) The Reliable Nuclear Fuel Services Working Group (RNFSWG) held its 3rd meeting in Cherbourg, France, on March 20, 2009. The meeting was hosted by France and included a tour of the La Hague reprocessing plant hosted by AREVA. The meeting was chaired by the United States and attended by 20 representatives from 10 partner states (Australia, Bulgaria, China, France, Japan, Jordan, Poland, the Republic of Korea, Romania, and the United States) as well as two international organizations (the IAEA and the Generation IV International Forum).

¶7. (U) The U.S. representative opened the meeting by reviewing the results of the inaugural RNFSWG meeting held March 31-April 1, 2008 in Wilmington, NC, USA (ref A) and the second RNFSWG held September 3-4, 2008 in Vienna, Austria (ref B). He commented that the first meeting had focused on a systematic review of the stages comprising the front end of the nuclear fuel cycle (from uranium mining through fuel assembly) while the second meeting shifted the focus to the back end of the nuclear fuel cycle. At the close of the second meeting, five issues were identified as needing further study: fuel assurances, the back end of the nuclear fuel cycle, fuel fabrication, fact finding, and collateral issues. The sub-Working Groups identified to address these issues were the focus of this 3rd RNFSWG meeting.

REPORT BY THE SUB-WORKING GROUP FOR COMPILING LESSONS LEARNED AND PERSPECTIVES FOR RESOURCE REQUIREMENTS

¶8. (U) BEGIN POLAND/FRANCE PRESENTATION: The representative from Poland presented a draft paper entitled "Nuclear Fissile Fuels Worldwide Resources," co-written by Poland and France. He commented that the Polish government recently announced its intention to build one or two nuclear power plants. Elsewhere, many other countries, including the UK and Italy were also considering the development of new nuclear power plants. Since it seemed likely that the demand for uranium would increase by this renewed interest, it was important to gain an understanding of the world's uranium (and other fissile fuel) reserves. The Polish representative noted that the

2007 OECD "Red Book" estimated the identified amount of conventional uranium resources that can be mined for less the USD 130/kg to be about 5.5 million tons U. Based on the global 2006 uranium consumption level (66,500 tons of Uranium or "tU"), this would be sufficient for about 85 years of uranium supply. If undiscovered conventional uranium resources are included (prognosticated and speculative), the estimate would rise to about 16 million tU, sufficient for about 270 years of operation at present consumption rates.

¶9. (U) The Polish representative concluded that sufficient conventional uranium resources will be available to allow for an expansion of nuclear capacities by a factor of 2-3 while maintaining electricity prices competitive with fossil fuels. The exploitation

of unconventional resources (low grade ore, phosphate rock, copper leaching solution, phosphoric acid, or sea water) requires additional research and development but has a potential to increase uranium production capacities by a factor of 2 or more in the medium term.

¶10. (U) According to this draft paper, total uranium resources could be extended relative to the once-through fuel cycle by recycling of fissile material (by 20%-30%), reactor improvements (5%-10%), and uranium recovery methods (about 20%) for a total potential gain of 40%-50%. The implementation of fast breeder reactors could increase the energy potential of today's known uranium resources by up to 70 times, enough for more than 3,000 years at today's level of consumption (though this figure was met with some skepticism by the Working Group, which called for further study). Finally, the Polish representative commented that fertile thorium can also be used as a nuclear fuel through breeding to uranium-233, though the requisite technology needs further development.

¶11. (U) The Jordanian representative commented that his country had looked into the feasibility of extracting uranium from phosphate, and preliminary results indicate that this process looks viable.

¶12. (U) A French representative noted that the Phenix fast reactor had just ceased operation in France. France has a plan for a new prototype fast reactor by the end of 2020. Since there are sufficient uranium resources available for about 200 years of operation with light water reactors (LWRs), he added, there is little pressure to develop industrial-scale fast reactors, though this should be achievable in principle. The Generation IV International Forum (GIF) representative reminded the working group that "sustainability" involved not only available resources, but also waste management and nonproliferation considerations. END POLAND/FRANCE PRESENTATION.

¶13. (U) BEGIN FRANCE PRESENTATION: The French Ministry of Energy representative gave a presentation on the "Legal and Organizational Framework of the Back End of the Fuel Cycle in France." She explained that France had decided to operate a closed fuel cycle, where spent nuclear fuel was reprocessed and civil plutonium extracted for use in mixed oxide (MOX) fuel, while ultimate waste (fission products and minor actinides) is isolated and conditioned for long-term disposal. This results in a savings of raw material (3,000 tU per year), a reduced spending for enrichment, reduced interim storage requirements, and reduced volume of spent fuel and high-level waste to be disposed of. She noted that in Europe, 35 nuclear power plants (NPPs) are capable of burning MOX fuel (20 in France), while Japan has 15-18 MOX-capable plants.

¶14. (U) The French Ministry of Energy representative described four pillars upon which France's radioactive materials and waste (RMW) management is based: (1) a sound legal and regulatory framework, (2) a solid research policy, (3) transparency and democracy, and (4) secure financing.

-- The legal/regulatory framework is based on the 1991 Bataille Act that defined principles for high level waste (HLW) and a 28 June 2006 Act on sustainable RMW management. In addition, a 13 June 2006 Act on nuclear transparency and security established the Nuclear Safety Authority (ASN) as an independent administrative body. According to these laws, disposal of radioactive waste originating

from foreign countries is forbidden in France, and may be imported

only for reprocessing, research, or transfer.

-- France's waste management research program is based on three complementary axes: (1) partitioning and transmutation, calling for an assessment of viable technologies by 2012 and potential pilot facilities by 2020, (2) deep geological disposal, calling for site authorization by 2015 and potential operation by 2025, and (3) conditioning and storage, calling for creation of new or modification of existing facilities by 2015.

-- Decisions about RMW management in France are taken with consultation with the local population (on a continuous basis), the general population (including national debates), and Parliament (whose views must be sought prior to any governmental decision).

-- RMW management authorities in France are provided secure and sufficient funds for research and development purposes and for waste management activities.

¶15. (U) Radioactive waste management in France is the responsibility of the National Radioactive Waste Management Agency (ANDRA), which will operate a disposal facility once operational. A second relevant body is the National Review Board (CNE), who is responsible for assessing the progress of studies related to RMW management.

¶16. (U) The working group discussed the disposal benefits of reprocessing, and France noted that 7 spent LWR fuel assemblies were used to produce one MOX assembly. As a result, the ultimate amount of waste to be disposed of is much lower. The United States representative pointed out since the spent MOX fuel must also be stored, the full disposal benefits of reprocessing would not be achieved until industrial fast burner reactors are available. The GIF representative added that fast reactors would also lower the radiotoxicity of the ultimate waste.

¶17. (U) The Romanian representative noted that reprocessing of spend CANDU reactor fuel was discussed during the (March 19) La Hague tour, during which AREVA noted that this would not be economical. When asked why, the French side explained that the total amount of spent CANDU fuel would be insufficient to justify the plant modifications that would be needed. END FRANCE PRESENTATION.

¶18. (U) The United States representative tabled a paper, entitled "Foreign Research Reactor Spent Fuel Return Program - U.S. Department of Energy Experience in Planning, Receipt and Transportation," which provided a review of this program and compiled lessons learned from its implementation. In the interest of time, there was no working group discussion on this paper.

¶19. (U) The Bulgarian representatives tabled a paper entitled "Preparation of the Activities to Ensure Nuclear Fuel Cycle at Units 5&6, WWER 1000 Type Reactors of Kozloduy NPP." In the interest of time, there was no working group discussion on this paper.

¶20. (U) The Working Group agreed to post all draft papers on "Lessons Learned and Perspectives for Resource Requirements" on the GNEP Portal for continued comment by Working Group members. A summary of the papers would then be prepared for presentation at the next GNEP Steering Group meeting in September/October 2009.

REPORT BY THE SUB-WORKING GROUP ON ELEMENTS AND CRITERIA FOR CLOSING THE FUEL CYCLE

¶21. (U) The French representatives tabled a draft terms of reference and work plan for a sub-Working Group on "Closing the Nuclear Fuel Cycle." They commented that the objectives of this sub-group would be: (1) to identify factors and limitations relevant to the back end of the fuel cycle, (2) to compile a list of current practices and frameworks, and (3) to recommend measures for moving towards fuel services arrangements achieving the management of spent fuel and closing the fuel cycle.

¶22. (U) Due to the complexities of this issue, the French representatives recommended proceeding over three stages to meet these objectives. First, a set of documents would be developed that identify the principal elements in need of discussion (including technical, legal, safety, security, policy, proliferation, and public acceptance considerations). The sub-group chairs would

prepare a first draft by June 2009 with the aim of finalizing a draft for review at the next RNFSWG meeting in fall 2009. Second, a compilation of current approaches to back-end management would be prepared with an aim of finalizing by the spring 2010 RNFSWG meeting. Finally, a document would be drafted that describes short- and long-term options for spent fuel management and closing of the nuclear fuel cycle. The United States representative informed the Working Group that the UK representative, who was unable to attend the Cherbourg meeting, had expressed interest in sharing leadership of this sub-group.

¶23. (U) The Korean representative commented on the need to clarify what the work plan means by "closing" the fuel cycle and whether this implied a closed fuel cycle based on existing techniques or advanced technologies still under development. The latter, he noted, would require significant research and development. The French representatives responded that this should be done progressively, in light of the last two elements of the GNEP Statement of Principles, which call for steps to "develop, and demonstrate, inter alia, advanced technologies for recycling spent nuclear fuel" as well as to "take advantage of the best available fuel cycle approaches." The United States representative seconded the notion that while "best available" approaches should be considered, the emphasis should be placed on advanced technologies designed that would be necessary for greater waste management and nonproliferation benefits. The Jordanian representative stressed the importance of the sub-group focusing also on international mechanisms and multilateral arrangements.

¶24. (U) The Working Group agreed it was necessary to add language to the work plan to address all of these concerns. The French representatives agreed to modify the draft work plan and circulate the revisions with an aim of reaching consensus by the April 7-8 GNEP Steering Group meeting.

DISCUSSION OF NEW SUB-WORKING GROUP ON MECHANISMS NEEDED TO INCREASE DIVERSITY OF FABRICATED FUEL

¶25. (U) The discussion on fuel assembly diversity began with a presentation by the IAEA representative. He summarized a recent Agency consultants meeting on this issue, the objectives of which were to identify and analyze possible mechanisms to increase the assurance of supply of fabricated fuel assemblies. It was stressed

that whereas LEU is a fungible commodity (essentially the same irrespective of producer), fuel assemblies are products with a high technological content, protected by intellectual property rights and proprietary components.

¶26. (U) The IAEA representative noted that the market is quite competitive and satisfactory, and for most reactor types at least two suppliers exist. Although it is possible for a reactor to change from one fuel assembly design to another, doing so requires extensive analysis and regulatory licensing work. Each new fuel type normally requires a new license and might require testing of lead assemblies. In certain cases, it is estimated that changeover from one fuel type to another can be accomplished in as few as two years, however the process typically takes about five years.

¶27. (U) According to the conclusions of the consultants meeting, the following approaches are suggested to reduce the time needed to switch fuel assembly suppliers: (1) the customer could have two fuel suppliers qualified to provide fuel, (2) the customer's government could establish well in advance specific agreements allowing a switch of supplier, or (3) the customer could make efforts in advance to obtain regulatory authorization for suppliers that are not yet certified. More generally, the risk of fuel assembly disruption could be reduced by establishing a local source of fabrication or by holding reserves of finished fuel assemblies.

¶28. (U) The Jordanian representative advised states to pursue multiple contracts for fuel assembly supply to minimize disruption risk. A French representative noted that there is no single measure that can be taken to offer 100% assurance, advising instead to take a combination of measures to reduce the risk of disruption. The Japanese representative announced that his Mission to the IAEA had hosted a January 2009 "Seminar on Global Nuclear Fuel Supply" during

which fuel assembly supply was discussed. Papers from this seminar are available at http://www.mofa.go.jp/policy/energy/iaea/seminar0902/index.html.

¶29. (U) During the meeting, no Working Group members were prepared to offer a detailed report of the steps they have taken to offer assurance of fuel assembly supply. It was therefore decided that members could submit voluntary reports to the group prior to the next Working Group meeting. There was no great interest from Working Group members to take the leadership role on a sub-Working Group on fuel assembly supply. Instead, it was decided that a workshop on industry perspectives in this issue should be organized during the fall 2009 Working Group meeting. Following this workshop, the Working Group will determine whether there is a need for a further work in this area.

DISCUSSION OF NEW SUB-WORKING GROUP ON ASSURANCES A COUNTRY SHOULD SEEK AS SUFFICIENT FOR NUCLEAR SUPPLY

¶30. (U) The discussion on fuel assurances began with a presentation by the IAEA representative. He identified two "co-equal" problems that were motivating recent work in this area: the risk of political interruptions of LEU fuel as a non-market disincentive discouraging investment in nuclear power, and the resulting incentive for building new national "proliferation-sensitive" enrichment facilities. Beginning in 2003, the IAEA has attempted to address these through the development of multilateral mechanisms

designed to provide reliable access to nuclear fuel. He identified 10 proposed fuel assurance mechanisms from various Member States, three of which were identified as relatively advanced:

-- a Russian-funded LEU reserve of 120 tons LEU to be stored at Angarsk, regulated by two agreements (Russia-IAEA and IAEA-Consumer State) to be approved by the IAEA Board of Governors. This may be presented to the Board for consideration at the June 2009 meeting;

-- a low enriched uranium "fuel bank," under IAEA auspices, funded by the Nuclear Threat Initiative, an American nongovernmental organization and the governments of the United States, the UAE, Kuwait, Norway, and the European Union. An institutional framework for this mechanism is under development and will possibly be presented to the Board of Governors prior to their June 2009 meeting; and

-- a German proposal for a "multilateral enrichment sanctuary project" whereby a group of interested states would jointly operate an enrichment facility in an "international territory" administered by the IAEA.

¶31. (U) The IAEA representative reported that at the March 2009 Board of Governors meeting, Director General ElBaradei stated that fuel assurance mechanisms should be based on three principles: (1) non-political, non-discriminatory, and available to all States meeting safeguards obligations, (2) release of fuel be determined by non-political criteria established in advance, and (3) no State to give up any Nuclear Nonproliferation Treaty (NPT) rights regarding any parts of the nuclear fuel cycle.

¶32. (U) Following the presentation, the Jordanian representative commented that the IAEA is by definition a strictly multilateral organization, so that any mechanisms under its auspices would have an added level of assurance. The French representative noted that France supports these projects (commenting that as EU president it played a big role in the EU fuel bank contribution) and was pleased to see movement towards discussion within the Board of Governors. The French representative also noted that the proposals as they stand do not impact any states' NPT rights. The Japanese representative noted that this issue was also considered at the January 2009 seminar Japan hosted in Vienna (see link above).

¶33. (U) During the September 2008 RNFSWG meeting, the possibility was raised of a sub-Working Group on "assurances a country should seek as sufficient for nuclear supply." The United State representative queried the group for interest in leading this sub-Working Group, and the representative from Jordan stated that Jordan would be willing to serve as chair. It will therefore prepare a draft work plan to present to the Working Group at the

fall 2009 meeting.

LEADERSHIP SUCCESSION AND NEXT MEETING

¶34. (U) The United States representative asked the Working Group if any nations were interested in taking over leadership of the group upon closure of the present meeting. In the absence of any explicit interest, it was agreed that the United States would hold the chair for one more meeting in fall 2009. At this meeting, the Working Group would select a new chair to lead the group in 2010.

¶35. (U) The Working Group was asked for expressions of interest for hosting the fall 2009 meeting. The Polish representative voiced interest. This meeting could possibly be arranged for Gdansk, Warsaw, or Krakow, but three months advance notice was requested.

¶36. (U) Regarding dates for the next meeting, the U.S. representative reminded the group that the IAEA Board of Governors meeting was to take place the week of September 7 and the General Conference would be held the week of September 14, 2009. To allow sufficient time to finalize meeting results for presentation at the next (late October) GNEP Steering Group meeting in China, the weeks of September 28 or October 5 were proposed. As chair of the Working Group, the United States will follow-up with a firm proposal for the fall 2009 meeting.

VISIT OF AREVA'S LA HAGUE RECYLCING FACILITY

¶37. (U) On March 19, the Working Group was invited by AREVA to tour its recycling facility at La Hague. Following a general presentation on the facility and AREVA's role in today's nuclear industry, Working Group participants toured the dry unloading facility T0, spent fuel storage pool D, a vitrification facility T7, and the control room of the UP3 plant. The tour provided Working Group members a close look at the elaborate design and immense scale of an industrial spent nuclear fuel reprocessing plant.

¶38. (U) FURTHER INFORMATION: Overseas posts requesting further information may contact the following US Department of Energy (DOE) officials:

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